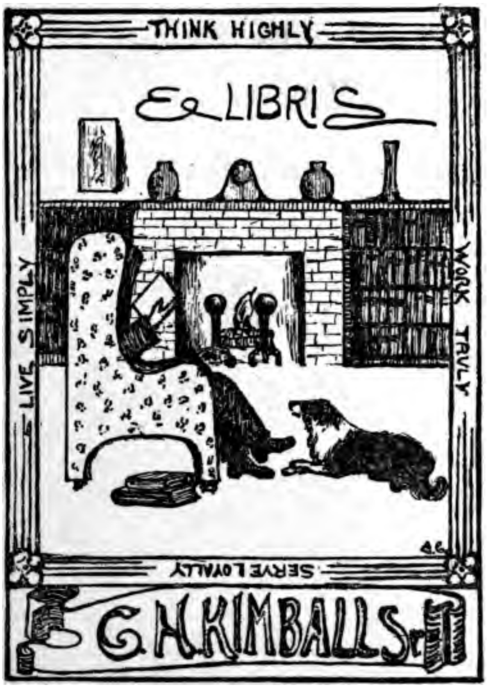
THINK HIGHLY
EX LIBRIS
LIVE SIMPLY
WORK TRULY
SERVE LOYALLY
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ECONOMICS FOR EXECUTIVES

A SERIES OF TWENTY-FOUR READING TEXTS WHICH CONSTITUTE AN INTERPRETATION OF THE UNDERLYING PRINCIPLES OF ECONOMICS AND BUSINESS FOR MEN AND WOMEN IN PRACTICAL LIFE

EDITED BY

GEORGE E. ROBERTS

AMERICAN CHAMBER OF ECONOMICS
INCORPORATED
NEW YORK

READING TEXT VII—ECONOMICS FOR EXECUTIVES

CAPITAL AS A FACTOR IN PRODUCTION

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Capital as a Factor in Production

I

Economics of Production

IN the preceding study-units we have considered some of the chief forms of productive activity, among others, the primary industries, manufacturing, transportation, and marketing. It will now be helpful to look into some of the aspects of production as a whole, noting first what constitutes production, then considering the various agents and agencies that enter into production, and observing how these work together to meet the needs of organized society.

Who Are Producers?

Strange as it may seem, there is much confused thinking about what constitutes production, and what classes of people are producers. Some people, for example, have the feeling that the farmers support all other members of society, and that, in the last analysis, only farming is productive. There is a disposition, as we have indicated, to assert

that marketing, and even transportation, are not productive, but that charges for these services are to be classed as a species of "toll" levied upon society. Similar opinions, more or less laudatory or invidious, are frequently expressed about the parts played by the various factors in production, as land, labor, capital, and the like. The claim is often made, for example, that labor produces everything. This doctrine sometimes is carried so far as to class all but those who do manual labor as "non-producers." The prevalence of theories of this sort shows the need of an adequate comprehension of what constitutes production and of what really entitles a man to call himself a producer.

What Is Production?

What, then, is production? Some seem to believe that it consists in creating material things. But science teaches that the supply of matter in the earth today is exactly the same as at the beginning, ages ago. Production cannot consist of creating wholly new matter. Even farmers do not do this.

Already existing matter, however, can be changed to make it better conform to man's needs and desires. The farmer who produces a bushel of corn, for example, has not brought into existence anything that was not previously present in the soil, in the air, and in the

seed, but he has assisted the forces of nature in changing the form of these elements to make them more suitable for human use. Technically, he has created *form utility*. By changing the form of the materials he has created something of use to mankind.

Form, Place, and Time Utility

But the creation of *form utility* is only one phase of the activity of production. The miner who digs a ton of coal, for example, does more than change its form, as by breaking it into usable sizes. He also moves it to a more accessible place.

But even then the work of producing coal is not ended. A ton of coal at the mouth of a mine is no more useful to the householder in the heart of a city than when it was deep in the ground. We must have the services of the various transportation agencies to bring the coal to the householder's bin. This is termed creating *place utility*, which is just as essential a part of production as the creation of form utility, and explains why transportation, for example, is entitled to rank with farming or manufacturing as a productive process.

In the study-unit on "Marketing," we saw that the wheat crop of the United States is harvested within twelve to thirteen weeks. But wheat is needed by consumers the entire

year round. Consequently, there must be persons who store wheat in times of plenty to make it available in seasons when wheat is not being harvested. These persons create *time utility*, another important part of the productive process.

The Production of Services

There is less question about whether those who create form, place, and time utilities are producers than there is about those who have no tangible commodity to show for their efforts, like teachers, doctors, soldiers, public officials, and the like.

Such persons are producers. They produce services. The productive nature of their activities is not quite so obvious as is that of producers of commodities, but their work is productive, nevertheless. Doctors render professional services which are essential to their patients. The military forces help to provide security, and people need security as well as food and shelter.

A Test of Productivity

Salesmen, brokers, advertisers, and others of similar occupation also produce services. The test of productivity for such persons is found in the statement that *nothing is fully produced until it is in the possession of the consumer and at the point of consumption.*

When consumers are shown by salesmen and advertising men that they need a particular commodity or service, then the activities of the salesman and advertising man help to produce that commodity or service. When buyers and sellers are not in contact with one another, the broker who commands the influence and the necessary connections for bringing them together renders both of them a service. The buyer or seller who values his own time and effort has reason to appreciate this service.

The type of services here referred to, if closely analyzed, may be classed under form, time, or place utilities. They are, however, sometimes called *ownership utilities or possession utilities.* But the name is of little importance provided the essential character of the service is understood.

Summary and Conclusion

Anyone who renders a service to consumers, therefore, or who contributes anything to the process of making commodities suitable to satisfy human desires, belongs to the class of producers. We accordingly define production as *the making of any direct or indirect contribution to the satisfaction of human desires.*

This brief discussion of the general nature of production should help to determine in

any given case whether or not a man is a producer. If he is a producer, then the analysis will help also to indicate just what he produces, whether it be a commodity or a service, one kind of utility or another, and just where his product fits into the general productive scheme.

II

The Factors of Production

Many of the questions about production which puzzle the average man grow out of the fact that the means of production are for the most part privately owned. Owners of property in the form of capital, for instance, draw incomes from their property. It is not primarily with the question of ownership, however, that we propose to deal here. We shall be concerned rather with the functions of capital itself, which would be essentially the same no matter how it is owned.

We have already referred to the claim that the workers of the United States, by producing everything, support both themselves and the propertied classes. In order to learn the true situation we must go beyond the conditions of ownership of the means of production and analyze these means themselves and see how they all work together. In short, we

must study the agents and agencies of production and see how they are organized.

The Factors or Agencies of Production

The factors or agencies of production are commonly said to be four in number. They are:

1. Land, or natural resources of all kinds,
2. Labor,
3. Capital,
4. Enterprise, or creative leadership.

Every one of these four agencies is indispensable for organized production. No one will question this statement as far as land and labor are concerned. They are obviously necessary. But some do question the need for capital, and the need for business enterprise; in fact, there center about these two agencies some of the most confusing problems of the time. The major portion of the present study-unit will, therefore, be devoted to a consideration of the nature and necessity of capital, while in the succeeding study-unit we shall consider the economic aspects of enterprise.

Why Misunderstanding Exists

The failure of many to see the importance of capital or enterprise is due chiefly to their failure to see just what these are. Thus

capital is thought of as being money and nothing else. Of course this is a great mistake. Capital, in the language of economists, is "produced goods devoted to further production"—that is, tools, machinery, and the like. We merely buy these with money or measure their value in money. Capital, then, as in the form of plows, does physical work, and the necessity for it cannot be doubted when once this point is clearly understood.

Another source of confusion is a loose way of speaking of capital, as in the phrase "the conflict of Capital and Labor," when what is really meant is not capital but "capitalists," as the owners of capital. The private ownership of capital is the real object of attack, and this distinction should be fully appreciated. It can best be understood by analyzing first the function of capital itself, considered as an agency in production, and then the function of the capitalist.

The Agents of Production

This analysis directs attention to one of the most characteristic and fundamental features of the prevailing social order. The use of each agency, or factor in production, under the prevailing legal arrangements, is dependent on the will of the owner. An inducement must be provided to the owner, therefore, in order to obtain the services of

his agency. Laborers own themselves and command their own labor and cannot be expected without some incentive to be willing to use it in production. In modern times the chief incentive is *wages*. Landowners sometimes prefer to use their land for the production of things for the markets or to satisfy their own wants, but in many cases they are brought by the payment of rent to put their land at the disposal of others. Here *rent* is the incentive.

Those who own capital in the form of funds or equipment and those who possess the power of creative leadership, respond to similar incentives. Business men or "enterprisers" are led to undertake productive enterprises in the hope of *profits*, while capitalists put their capital at the disposal of enterprisers in return for *interest*, as, for example, the interest paid on bonds.

The agents, agencies, and incentives that are responsible for production may be listed, then, as follows:

Agency	*Agent*	*Incentive*
Land	Landowner	Rent
Labor	Laborer	Wages
Capital	Capitalist	Interest
Enterprise	Enterpriser	Profits

At a later point we shall discuss in detail the incentives necessary to secure the services

of the different agents in production. At this point it is sufficient to recognize that under the prevailing conditions the provision of a suitable incentive is fundamental and necessary if production is to go on.

III

Capital—Its Nature and Importance

Capital is best defined as *wealth or goods, other than natural resources, which are used for productive purposes rather than for direct consumption.* They are sometimes called *capital goods.* This is to distinguish them from capital funds on the one hand and from consumption goods on the other hand. Examples of capital goods, as already suggested, are tools, machinery, factories, roads, bridges, and the like — in short, all the agencies of manufacture and transport. In our discussion of capital as a factor in production we are concerned with capital goods. We shall use the term "capital" simply as a short name for "capital goods."

Modern Opportunities Require Capital

Capital will commonly be used in production only when business men believe that they see opportunity for its profitable use. They

will usually erect buildings, construct machinery, purchase coal, and hire men, only when they believe the chance for gain exceeds the prospect of loss. Consequently, the demand for funds to be used for productive investment is large when such opportunities are numerous and attractive and when business men have the vision to see them and the courage to embrace them. At certain times business men are very eager to embrace productive opportunities, as when business is booming, while at other times they are very timid, as in periods of business depression. But at all times the business man's opportunity to profit by engaging in the production of something depends on his command of capital, and this fundamental truth should never be overlooked.

The reason why business opportunities in modern times call for the use of capital is because of the superior efficiency of the roundabout method of production. This method was briefly described in the introductory study-unit and in the study-unit on "Manufacturing," and was also illustrated in the discussion on "Railroad Transportation." The existence of railroads, as was there pointed out, depends altogether upon a very heavy initial investment in terminal facilities, rolling stock, and the like.

The Roundabout Method of Production

Without the use of the roundabout method, the primary industry of farming could not have developed within the last century to the point where it has brought forth enough food to sustain a population many times larger than that of one hundred years ago. The prices of food stuffs could not have fallen throughout the century. We should not be getting more power from the same amount of coal, more iron and steel from the same amount of ore, a larger quantity and a greater variety of products of petroleum, and more sugar from the same quantity of beets. We should not have been able to find ways of manufacturing textiles or steel products and of slaughtering animals and packing meat, which increase the output for each worker many times over. The output of cotton cloth per man per day could not have increased within the last forty years by almost a hundredfold, nor could similar results have been attained in grinding flour or making shoes. In the primary industries, in manufacturing, in transportation, and in marketing, the high efficiency of modern methods of production could not have been attained without the use of capital goods. That is, it could not have been attained by the direct

method of production, but only by the indirect or roundabout method.

Two Contrasted Methods

By the *direct method of production,* people produce only for immediate needs, consume every day or every year about all they produce during that time, accumulate no surplus and are consequently able to command only the bare necessities of life. This method must have been used by our remote ancestors, and is the only one that prevails in the animal kingdom. Animals that feed on plants must every day forage for that day's food, and animals that feed on other animals must catch their prey as needed.

So in earlier stages of society, man lived from hand to mouth without much foresight and without providing anything notable in the way of tools and equipment for future use. The poverty of primitive peoples is proverbial, and the fact that modern nations have escaped from it during the last two centuries is due to the development of the indirect or roundabout method of production.

The Modern Way

Peoples who use the *indirect method* do not confine themselves merely to gathering the fruits of the earth day by day as they may be needed, but plan ahead and make pro-

vision for the future. They do not "grind the seed corn," but plant it in prepared soil, then cultivate it by the use of tools and implements. Neither do they use as tools the first stick or stone they find, but utilize tools which have been evolved in long and complicated manufacturing processes. They are abundantly supplied with productive equipment and they maintain and increase this equipment so that a continuous and increasing supply of finished products may be forthcoming.

The indirect method involves the expenditure of effort far in advance of its ultimate fruits. Work spent in mining ore today for use in the form of steel for making machinery, which in turn is used for making something else, produces nothing that the miner can use today. Either he must wait for what he wants until some far-off time, or someone who has what the miner wants must give it to him and must himself wait for the finished product. The indirect method of production, then, as contrasted with the direct method, makes heavy demands on human patience and involves as a primary necessity a *willingness to wait for returns.*

An Illustration

A concrete way of indicating the nature and advantages of the indirect method of

production is by referring to the productive efforts of primitive man. This is done in the following extract from a work of one of the best known American economists,[1] which begins by referring to what we have called the direct method of production:

"A primitive fisherman has frequently been used as an illustration of this simple process. He has been in the habit of catching fish with very simple tackle, but he sees an opportunity of increasing his catch if he can only get some kind of boat, so he decides to spend a part of the time each day in making one. By this combination of frugality and industry he eventually comes into possession of a boat which thereafter adds to his income and more than compensates him for the frugality which he practiced during the period in which the boat was building. This case is doubtless real enough to serve as an illustration of the essential process of increasing the stock of capital.

"It has not been many generations since farmers used very crude and simple implements, some of which they could make for themselves. The farmer who made his own plow was depriving himself of the opportunity for amusement, which is a kind of consumption, or was reducing somewhat his consumption of material goods during the period when the plow was being made. After it was finished, it assisted him in producing subsistence, and added to his income available for consumption. This is in all essential particulars similar to the case of the primitive fisherman.

[1] Thomas Nixon Carver, Principles of Political Economy. (Published by Ginn & Company. Reprinted by permission.)

"A little later, however, the farmer, instead of making his own plow, hired a blacksmith to make it, paying the blacksmith money for his work. Here we have the same combination of labor and frugality as in the other cases, the difference being that in the making of the plow the blacksmith does the laboring and the farmer exercises the frugality. With the money which he paid for the plow he could have bought consumers' goods and had immediate enjoyment. He postponed that enjoyment when he paid the money to the blacksmith and received the plow. In the then distant future, however, the plow added to his income and enabled him to make up for the loss of opportunity for immediate consumption, and thus compensated him for the postponement which he underwent when he purchased the plow.

"The modern farmer, however, instead of hiring the blacksmith to make the plow, usually buys his plow ready made. So far as he is concerned, the act of frugality is the same as though he deliberately hired the blacksmith to make it. He surrenders a certain amount of ready cash with which he might have bought consumers' goods; he receives the plow, which for a period of years will add to his income and therefore compensate him. In the making of the plow, however, there were other tools used, as well as labor. Those other tools had been made in much the same way as the plow. Someone had invested money in them and then hired other labor to use these tools in the making of the plow.

"It has become, therefore, a very complicated process; but anyone who will analyze the process will find always the same two factors involved: namely, waiting and working—the postponement

of consumption, on the one hand, and labor, on the other. No capital can ever come into existence without this combination. It is merely obscured by the intricacies of the modern industrial process, and it requires a little more intelligence and study to see clearly where and how the frugality and the labor are combined."

There are four important points brought out in this illustration, the first two of which have already been mentioned.

1. Resort to the indirect method of production, as by first making a boat and then using the boat as an aid in fishing, increases the efficiency of production. It consequently leads in the end to much greater consumption.

2. The indirect method requires the use of capital, as the boat or the plow.

3. The production of capital requires saving.

4. Producers must wait for results when they produce by the indirect method.

Let us consider especially the latter two points.

Capital Results from Saving

The only way in which society can have capital goods is by deliberately producing them instead of producing consumption goods for the satisfaction of immediate wants. Capital exists because men choose not to consume every year all that they produce that

year, but, by exercising self-denial where necessary, choose to make things which cannot be directly consumed but which are to be used only for productive purposes.

This means that capital comes into existence through saving. In the case of a farmer who does not have all his wheat made into flour but saves some of it for seed, for the sake of the next crop, his saving is very evident. It is quite as evident when the farmer saves ready cash which he spends for a plow. With these truths understood it becomes no less evident that the production of factories and railroads by the use of capital funds which have been collected from thousands of individuals, requires that the funds be first saved by these individuals. The individuals are all obliged to forego something of immediate use if they are to put themselves in a position to make capital investments.

The term "savings" does not always mean sums that have been slowly and painfully collected, or collected by individual self-denial. It includes accumulations, however made, of wealth that has been "saved" from consumption and is available for use as capital. It all serves similar public purposes when it becomes capital, whether accumulated in small or large sums. A large part of the capital

funds for the development of industry has been provided by the industries themselves from profits which have been accumulated.

Corporate Savings

Instead of making complete distribution of earnings it is common practice among the more prosperous concerns to pay dividends when possible at a moderate rate, such as can be uniformly maintained, and to carry the surplus of good years into a surplus fund, for investment in additional plant and equipment, thus providing for the growth of the business.

These "savings," which appear in published reports of corporations in the form of additions to "surplus," are not so readily apparent as are the money savings of individuals, but they are savings nevertheless. The public view of profits often does not consider the extent to which they go into industrial use, where they result in larger and cheaper production. Oftentimes the public view is that profits accrue only to an individual, and can serve no productive purpose.

The truth is that a large portion of profits earned in business and industry in the United States has been reinvested. Manufacturing and mining corporations have long pursued the policy of retaining every year as much as one third of their net income for reinvestment

and during the great war many retained an average of more than 50 per cent. Gigantic enterprises, such as the Ford Motor Company, have been constructed entirely out of profits, and many other large industries might be specifically mentioned. The facts prove conclusively that corporate savings made by reserving and reinvesting a part of profits have been an important source of the capital by which industrial development has been advanced.

The Savings of the Well-to-do

Another important source of capital is found in the savings of persons of large or very large incomes.

There is a somewhat vague but popular idea that a very rich man's income is kept in a vault or is somehow withdrawn from common use and devoted to the owner's exclusive benefit. This is not the case. His income is not buried in the ground or secreted in some private hiding place; the acquisitive desire of the owner forbids that. The only way that such income can be put to profitable use is by increasing production in some manner.

To the extent that men of any class consume riotously or invest unwisely they withdraw capital from the common service. This statement applies as fully to men of

large means as it does to men of small means. But wise investment in productive enterprise contributes to the progress of society. The fact is, moreover, that the greater part of all the accretions of private wealth are in the form of equipment for increasing production. Moreover, the things produced are mostly those of which the rich, few in number as they are, can consume comparatively little.

How Benefits Are Distributed

The concrete benefits resulting from invested wealth are not distributed according to the ownership of the productive property, but according to the consumption of the products; and we have only to look about us to know that the goods and services which are the products of our chief industries are very widely distributed. There are millions of people who on any given day own but little property of any kind in comparison with the value of that which they consume in the course of a year. The estimates of the distribution of wealth that are based upon statistics of ownership are faulty in that they take account of little but permanent, fixed property, leaving the continuous flow of goods and services ministering to the daily wants of the people almost entirely out of the calculation. This flow is enormously increased by means of invested capital, but, as the statistics of all

advanced countries show, it goes mainly to labor in exchange for current services.

Much of the current discussion of the private ownership of capital appears to overlook this important point. It seems to assume that nobody derives any benefit from capital but the owners, a proposition that will not stand examination. It is like saying that nobody has ever gained anything from the development of the steam engine but the owners of engines, or from the building of railroads but the owners of railroad securities. Of course this is not the case. The truth is that all privately owned industrial establishments are part of the equipment by which the wants of society are supplied. They all are doing the same sort of work and rendering the same essential service as though they were owned by the state.

All that portion of an individual's private income which is saved and becomes capital is devoted to a public purpose while so employed. Take for illustration the case of a farmer who regularly devotes all of the surplus income from his land, above moderate pay for his labor, to improving the productive capacity of his farm, by underdraining and fertilizing it and providing the best quality of stock and suitable buildings. By increasing the productivity of his farm he is increasing the supply of food upon the public market.

If the farm were owned by the state it could serve the common good only by being managed in the same way.

How Capital Serves the Public

An illustration of the public benefits of wealth privately owned is furnished by the steel industry. The total production of steel in the United States in 1880 was 1,240,000 tons. In 1910 the production had risen to 26,000,000 tons. The population of the country had about doubled and the consumption of steel had increased twentyfold; this increased use resulted from a continuous fall of prices in the steel market during this period.

A concrete incident from the editor's own knowledge illustrates this very strikingly. In the late sixties there was built over the Saint Lawrence River at Montreal, the famous Victoria bridge, then one of the wonders of the world. Some years ago it was torn down and a new steel superstructure was placed on enlarged abutments.

The Old and the New

The old bridge was sixteen feet wide, and carried one railroad track. The new bridge is sixty-seven feet wide, carries two railroad tracks, an electric car line, and a wagon way. The old iron work cost $3,000,000 and the

new steel work cost $1,500,000. This development was almost coincident with Andrew Carnegie's active career in the steel industry. It illustrates the service rendered to the public by capital owned in large part by very rich men. The service was the same as if ownership of the capital had been widely distributed or in the hands of the government.

The truth is that no wealth can be made to bring a financial return to its owner unless it is invested in producing things which the people want, unless, in other words, it is used in the public service. The opinion above referred to, that a rich man's wealth is altogether withdrawn from the common supply so that other people have less in consequence, is true only of the portion which he and his dependents actually *consume*. Additions to capital almost all go to increasing the supply of consumable goods and everybody can have more in consequence.

Discharge of the Capital Function

A recognition of this fact is desirable on the part of all classes of society. It is especially important for those who own and control large wealth. The very fact that they receive large incomes and own the properties from which these incomes are received, carries with it a responsibility for the efficient, ethical, and economical discharge of the capi-

tal function. Since the wealthy are able to save large sums they are under obligation to do so. Thus there are economic grounds for the popular condemnation of wastrels and profligates.

There is also ample reason, in the very nature of the case, why popular approval should continue to be accorded only to capitalists who take their function seriously on the investment side. They face a responsibility of discovering investments which not only pay them reasonable returns, to prove that they are not throwing capital away, but which also involve forms of business management and species of business practices that conform to an advancing standard of social ethics. Capitalists who can make money for themselves only by investing in concerns which grind the faces of their employees, exploit the ignorance of consumers or otherwise "fly the black flag in business," deserve a condemnation which they are coming to receive in volume both from the mass of people and from other capitalists who are more scrupulous and more capable.

On the other hand, it is important that the public shall discriminate between the rich who use their incomes in the expansion and development of production or for worthy public purposes, and those who use their

incomes largely in wasteful expenditures. Unfortunately, popular opinion is inclined to favor a "good spender," upon the mistaken theory that private wealth is thus being more effectively distributed. Of course the distribution which takes place when a new factory is built is just as real and widespread as when the same amount is disbursed in nonproductive extravagance; and in the former case a permanent wealth-producing industry is created, while in the latter there are no after results.

The Right Line of Analysis

The question as to how far capitalists at present are doing not merely their duty but their full duty must come up for consideration in later study-units. The above analysis of the function of capital in production is not intended to pronounce finally on that question. But the allusion to the social service performed by capital as such, whether it be owned privately or owned publicly, is designed to direct attention to some essentials and indicate the direction which constructive criticism should take.

Capital performs an essential economic function. It performs this function with substantial efficiency in the hands of private capitalists. The workings of competition contribute to this end. So do the cooperative

relationships which bind together the financial gains of investors and the concrete services enjoyed by consumers. Those who start with an understanding of these basic facts will be in a better position to locate the points and develop the methods by which improvement may be brought about in the way in which the capital function is performed.

An Old Fallacy

Wage earners of course are among those who benefit from the use of capital, but they do not always appreciate this fact. Thus they have sometimes opposed the use of capital, as represented by the introduction of machinery. A well-known instance of this opposition is found in an incident that occurred in England after the knitting frame had been invented.

In the counties of Leicester and Nottingham, workmen destroyed the new knitting frames (over 1000 in a single burst of popular outcry), burned houses, threatened the inventors, who had to fly for their very lives, and order was not finally restored until the military was called out and the leading rioters either arrested or hanged or transported. It is true that the introduction of the machines caused for a time a displacement of labor. It has been said that 50,000 stocking-knitters were thrown out of work, and that it

was many years before they all found other employment. Time is required to make such changes, but in the knitting industry the ultimate result was that for every person poorly fed, poorly paid, badly clothed, and miserably housed, who in 1800 was engaged in making stockings by hand or in preparing material out of which stockings could be made, over one hundred were employed in the same industry less than a century afterwards. And those so employed in 1900 worked for one third less number of hours per week, at from three to seven times the average wage, and lived under conditions of comfort which their predecessors hardly dreamed of.

The Gains from Production

The introduction of coal cutting machinery in the United States has been commonly opposed by certain labor organizations and similar opposition to such machinery in England is still quite effective. Yet, over a term of years, the average production of bitumious coal per worker using such machinery in the United States has been 550 tons per year as against 270 tons per year in England, where such machinery is not used. The increased efficiency of coal production has benefited everyone who uses coal or who uses anything produced by the use of coal. This means that

it has benefited everybody, including wage earners in general, such as carpenters, bricklayers, and machinists, who are, of course, consumers of coal. Members of the wage-earning class, as this illustration shows, benefit from the use of capital because they are consumers of the goods that are thus supplied more cheaply and in greater abundance.

The United States Census Bureau has estimated that at the beginning of the nineteenth century approximately 90 per cent of the population of this country was engaged in agriculture at least a part of the year. The factory production of goods was very small. The people worked very long hours in the fields, at the household industries and with hand tools to provide for their simple wants. At the present time, as a result of the development of agricultural machinery, about one-third of the population, working upon the farms, is able to provide the food supply for all, including a very considerable surplus for export. More than one-half of those formerly engaged in food production have been released to the other occupations which contribute to the common comfort and welfare.

In all the industries the power of the individual worker has been multiplied several times by the use of machinery. The first report upon the use of power in manufacturing

establishments was made by the census of 1870, at which the total number of horse-power employed in this country was 2,346,-142, which was about one horse-power to every nineteen people in the population. In 1914 the number was 22,547,574, which was more than one horsepower to every five of the population. This does not include the power used in transportation.

When account is taken of the increased capacity of the machinery driven by this power, some idea is gained of the enormous increase that has been made in the supply of goods for consumption. The effect of machinery is to increase the capacity of the people to supply their wants. Their standard of living has been raised far above what would be possible without machine equipment.

Does Capital Displace Labor?

The introduction of machinery does not tend to diminish employment, as is often supposed, but rather to increase employment. The reason why this is the case may be effectively brought out as follows:

Suppose the automobile industry to be just starting, and to be relying so much upon handwork that 1000 men are required to turn out ten cars a day. If, by the investment of capital in machinery, the same number of cars can be produced every day

by 500 men, will the others be forced into idleness?

At first, of course, if the improvement is made suddenly, some automobile mechanics are likely to be thrown out of work. This result will follow, however, only if the public demand for cars does not expand. But the effect of the improved method is to reduce the cost of manufacturing automobiles, first in the more progressive factories, and presently in all the others. Competition of these concerns, therefore, reduces the selling price of cars, with the result that more people can afford to buy them. In consequence, the demand for cars will presently increase. To meet this demand more cars must be built, and therefore more men will be employed to make them. The increase in demand may even keep pace with the introduction of the improvement, so that no considerable number of mechanics will be thrown out of work at all, provided they are willing to work at machines.

Furthermore, the people who would buy cars even at the high price necessary under the handwork method of production will now get them more cheaply. With the money they save in this way, they will be able to buy something else. Whatever they buy with this money requires labor. So the fact that

500 men working with machines can now turn out as many cars as 1000 hand-workers formerly turned out, need not add the other 500 to the "army of the unemployed." There will be openings for these men, either in the automobile industry itself or in the other industries to which a larger part of the purchasing power of consumers now goes.

The net result of such improvements, therefore, has been to bring the comforts and even the luxuries of life within the reach of more people without diminishing the demand for labor. In fact, these improvements have increased such demand because they have increased production, more production means more purchasing power, and more purchasing power means more employment for labor.

Readjustment Must be Made

It is true that wage earners may and often do suffer temporarily from these readjustments. They must sometimes shift from one industry to another, which they can do only with considerable difficulty. Skill acquired for work in one line may be of little value in another. Most serious of all, workers to an important extent cannot and to some extent simply do not, save; hence they have nothing to tide them over a period of readjustment. Doubtless this is one fact that prevents them from looking upon readjust-

ments in labor from the long run view-point. While they are waiting for readjustments to take place their incomes may entirely stop. A serious social problem is that of devising methods for carrying workers through periods of readjustment, and another is that of insuring that work at machines shall not involve needless danger or exercise a deadening effect on workmen.

At the same time, it must be borne in mind that the burden of readjustment due to new inventions falls upon capitalists as well as upon laborers. Once investment is made in a certain type of machine or equipment, it must stay in that form. The next invention in that field will mean the loss of virtually the whole prior investment. From this standpoint every inventor may be regarded as a "conspirator" against the owners of old capital.

The difficulties of readjustment are very real, but they cannot be permitted to obscure the advantages. Those who appreciate this fact are charged with the double responsibility of coping with the difficulties and of insuring that the improvements do take place.

The Attitude of Labor Leaders

Examples of the way in which laborers have benefited from increased production are now so common that working men and labor

leaders are coming to have an active appreciation of the principle involved.

Thus the importance of production has been emphasized as follows by Samuel Gompers, head of the American Federation of Labor:

> "Only out of production can we all grow prosperous, and every aid to production that does not involve human waste is a benefit to society. If the added production is gained at the cost of a human being then it does not help society, because even from a cold standpoint of economics it tends toward overproduction by destroying in the very making of the product those who would directly or indirectly buy that product. Whatever are the evils in the distribution of the products of work (and there are many of them), these evils are not going to be cured by producing less.
>
> "That will not solve the problem of distribution. That will provide humanity with one bone instead of two to snarl about. As I said before, I am in favor of every possible device which will increase the productivity of human labor and increase its standards."

The Hon. William B. Wilson, former Secretary of Labor, and himself closely identified with the labor movement, has also spoken out clearly on this point.

> "In looking back over the history of our industrial development we wonder why it was that in the early days of the introduction of labor-

saving devices workingmen vigorously protested against them, even to the extent of attempting their destruction. We have made much progress since then, and we now realize that every device, and every method that can be introduced by which a greater amount of production is secured by the same amount of labor is a material advantage ultimately to all the people of the world. The protest was due to the fact that all of the burdens, all of the hardships and all the cost of readjustment incident to the introduction of such machines had to be borne by the wage workers. It did not appeal to them that future benefits would be derived from the use of the machine in view of the fact that it brought immediate and present want to them."

These expressions are representative of the most intelligent and influential opinion among American organized labor on this fundamental proposition.

Increased Productivity Needed

It is now recognized to be a mistake to think that the chief industrial problem is to find work to do or to provide work for all. Work is not wanted for itself, but for its products—the comforts which are obtained by work. Nobody will work unless the work is rewarded, and the real industrial problem is to give labor the highest possible productivity. We want thirty bushels of wheat to the acre from the labor that now produces

fifteen bushels, and like gains all around the circle of the industries. Such results will mean a larger distribution of comforts to everybody.

All modern production is for the market, consisting of the body of the people. Most of these people are wage-earners and their ability to purchase depends upon the wages that they earn. Capitalists, either directly or by lending their funds, must therefore hire labor not only for its assistance in production, but also in order to create a market for their own products.

All Progress Together

All of the new capital which is always being accumulated is bound to find investment, and the only wide field for investment is in doing or making something that will serve the public. In all advanced countries the tendency is for capital to increase faster than population, so that there is a constantly increasing amount of capital per capita which is obliged to find employment in supplying our wants. Under the impetus of increasing investment, industry would choke down and come to a standstill if the buying power of the masses did not constantly increase. There is bound to be such a continual readjustment of wages and prices as will enable the population to absorb the increasing production.

Producers Mutually Dependent

If this point seems obscure it is only because attention is often confined to a single enterprise. It will be clear enough when a group of concerns are considered together. Thus capitalists cannot make profits in the furniture industry by paying to their own men enough wages to buy all the furniture produced. Neither can manufacturers of automobiles profit by any similar arrangement. But the men who are hired to make automobiles and are paid wages for doing so make part of the market for the furniture and the wood workers in the furniture factories make part of the market for the automobiles.

Thus the producers in the furniture business and the producers in the automobile business advance together. In fact, producers in all businesses advance together. Since the introduction of machine methods which produce standardized articles by the millions, business men can market these products and enjoy their profits and interest only when the masses of the people are at work earning the incomes to buy the products.

The Capitalists' Interest

These facts throw doubt on occasional apprehensions that capitalists as a class may

conspire to cut down wages and deprive the workers of the comforts of life. If this should transpire it would be destructive of business and of capital, and therefore, the idea of a general conspiracy to that end is not at all reasonable.

These facts also answer the statement, often heard, that labor does not benefit from increased production. The great body of purchasers are themselves laborers, and if they do not have the means to buy, then increased production will bring no additional profits to anybody.

IV

Summary: The Needs of Modern Production

The foregoing analysis of capital and production leads to some significant conclusions. It gives some of the most fundamental reasons why the volume of commodities and services now available is so tremendous. It also serves to show the main conditions required for further progress.

The Purpose of Business

The ultimate purpose of the whole industrial and business organization is to supply the needs and wants of the population.